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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/593,207	12/06/2007	Stephen Richard Coulson	41577/335363	8768
23370	7590	12/02/2011	EXAMINER	
JOHN S. PRATT, ESQ KILPATRICK TOWNSEND & STOCKTON LLP 1100 PEACHTREE STREET SUITE 2800 ATLANTA, GA 30309			YANG, JIE	
			ART UNIT	PAPER NUMBER
			1733	
			NOTIFICATION DATE	DELIVERY MODE
			12/02/2011	ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ipefiling@kilpatricktownsend.com  
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<b>Office Action Summary</b>	<b>Application No.</b> 10/593,207	<b>Applicant(s)</b> COULSON ET AL.	
	<b>Examiner</b> JIE YANG	<b>Art Unit</b> 1733	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 23 September 2011.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on \_\_\_\_; the restriction requirement and election have been incorporated into this action.
- 4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 5) ☒ Claim(s) 1-20 is/are pending in the application.
- 5a) Of the above claim(s) 17-20 is/are withdrawn from consideration.
- 6) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 7) ☒ Claim(s) 1-16 is/are rejected.
- 8) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 9) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 10) ☐ The specification is objected to by the Examiner.
- 11) ☒ The drawing(s) filed on 18 September 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 12) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. ____.                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>11/8/2006</u> .   | 6) <input type="checkbox"/> Other: ____.                          |

## **DETAILED ACTION**

### ***Election/Restrictions***

Application's election of Group I, Claims 1-16, drawn to a process for depositing a polymeric material onto a substrate by plasma assistant, in the reply filed on 9/23/2011 is acknowledged without traverse (MPEP 818.03(a)). Claims 17-20 are withdrawn as non-elected claims; and Claims 1-16 remain for examination, wherein claim 1 is an independent claim.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-10 and 12-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Badyal et al (US 6,551,950 B1, hereafter US'950) in view of Lee (US 4,827,870, hereafter US'870).

Regarding claim 1, US'950 teaches a process of coating a surface with a polymer layer by exposing said surface to a plasma comprising a monomeric unsaturated organic compound (abstract of US'950) in gas form (Col.3, lines 3-10 and examples 1-5 of US'950), which reads on the process for depositing a polymeric material onto a substrate comprising introducing a

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monometric material in a gaseous state into a plasma depositing chamber as recited in the instant claim. US'950 teaches applying plasma glowing discharging and pulsed field (Examples 1-5 of US'950), which reads on the igniting a glow discharge and applying a voltage as a pulsed field as recited in the instant claim. Regarding the power density of from 0.001 to 500W/m<sup>3</sup> as recited in the instant claim, US'950 teaches applying an average pulsed power about 0.04W with 20μs pulsed time on and 20,000μs pulsed time off (Col.7, lines 61-64 of US'950), which is the same average pulsed power and pulsed conditions as recited in the instant invention (Page 10, line 6-9 of the instant specification), therefore, a similar power density as claimed would be highly expected in the process of US'950. MPEP 2112.01. US'950 does not specify a plasma zone with a volume of at least 0.5m<sup>3</sup>. US'870 teaches a plasma enhanced chemical vapor deposition process within a chamber comprising organic component (Abstract of US'870). US'870 teaches a 0.5-1.0 cubic meter plasma reaction zone under vacuum condition (Col.4, lines 39-49 of US'870), which is within the plasma zone volume range of at least 0.5m<sup>3</sup> as recited in the instant claim. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply a 0.5-1.0 cubic meter plasma reaction zone as demonstrated by US'870 in the process of US'950

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because both of US'870 and US'950 teach plasma processes for the organic material deposition and US'870 teaches that the excitation of the plasma allows chemical and physical thin film forming at a low temperature conditions (Col.4, lines 45-53 of US'870).

Regarding claims 2-3, as discussed in the rejection for the instant claim 1, US'870 teaches a 0.5-1.0 cubic meter plasma reaction zone under vacuum condition (Col.4, lines 39-49 of US'870), which overlapping the claimed chamber volume of about 1 m<sup>3</sup> or more (claim 2) and/or the chamber volume between 1m<sup>3</sup> to 10m<sup>3</sup> (claim 3). The overlapping in the volume range creates a prima facie case of obviousness. SEE MPEP 2144.05 I. It would have been obvious to one of ordinary skill in the art at the time the invention was made to select the claimed chamber volume from the disclosure of US'870 in the process of US'950 because both of US'870 and US'950 teach plasma process for organic material deposition and US'870 teaches that the excitation of the plasma allows chemical and physical thin film forming at a low temperature condition (Col.4, lines 45-53 of US'870).

Regarding claims 4 and 5, US'950 teaches applying an average pulsed power about 0.04W with 20μs pulsed time on and 20,000μs pulsed time off (Col.7, lines 61-64 of US'950), which is

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the same average pulsed power and pulsed conditions as recited in the instant invention (Page 10, line 6-9 of the instant specification), therefore, a similar power density, for example 0.001 to 100w/m<sup>3</sup> (claim 4) and /or 0.04 to 100w/m<sup>3</sup> (claim 5) would be highly expected in the process of US'950. MPEP 2112.01.

Regarding claims 6-9, US'950 provides the same acrylate formula (Col.3, lines 11-64 and Col.5, lines 15-17 of US'950) as claimed.

Regarding claim 10, US'950 teaches applying inert gas as carrier gas for monomeric compound (Col.3, lines 3-5 of US'950), which reads on the limitation of the instant claim.

Regarding claims 12-14, the gas leaking rate (claim 12), the chamber pressure (claim 13), and the pulsed power on-off condition (claim 14) are recognized as controllable parameters in term of film coating as evidenced by US'950. US'950 teaches that gas pressure range is from 0.01-10mbar (Col.4, lines 19-26 and claim 14 of US'950); the power is on for 20μs and off from 10000μs to 20000μs (Col.4, lines 34-35 of US'713); and US'950 provides a leak rate of better than 2x10<sup>-3</sup>cm<sup>3</sup>min<sup>-1</sup>, these conditions are within the claimed gas pressure range (claim 13), reads on the claimed pulsed power on-off condition (claim 14), and overlaps the gas leaking rate (claim 12). Therefore, it

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would have been obvious to one of ordinary skill in the art at the time the invention was made to choose proper experimental parameters as demonstrated by US'950 in the process of US'950 in view of US'870 in order to obtain the desired coating films (Examples -1-5 of US'950).

Regarding claims 15 and 16, US'950 does not specify the temperature of the chamber. US'870 teaches that the typical process temperature may be 20 to 100 degree centigrade (Col.4, lines 45-49 of US'870). It would have been obvious to one of ordinary skill in the art at the time the invention was made to choose proper processing temperature, for example heating during deposition from the disclosure of US'870 in the process of US'950 because US'870 teaches that the excitation of the plasma allows chemical and physical thin film forming at a low temperature condition (Col.4, lines 45-53 of US'870).

Claims 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over US'950 in view of US'870 and further evidenced by Robles et al (US 6,663,713, thereafter US'713).

Regarding claim 11, US'950 teaches applying inert gas as carrier gas for monomeric compound (Col.3, lines 3-5 of US'950), but US'950 in view of US'870 does not specify applying helium as

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carrier gas. However, applying He gas as a carrier gas in plasma operation is a well-known technique for a polymer coating process as evidenced by US'713. US'713 teaches a process of forming thin polymer layers on semiconductor substrates (Abstract of US'713) and US'713 teaches that: "An inert carrier gas such as helium or argon is preferably used to supply the reactive polymerizable material into the chamber. This inert gas and the RF bias may be used to form a plasma within the processing chamber in some applications." (Col.4, lines 12-16 of US'713). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the well-known carrier gas, that is helium as demonstrated in US'713 in the process of US'950 in view of US'870 in order to form a desired plasma within the processing chamber (Col.4, lines 12-16 of US'713).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jie Yang whose telephone number is 571-2701884. The examiner can normally be reached on IFP.



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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on 571-2721244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jie Yang/  
Patent Examiner, Art Unit 1733